

WHAT IS CLAIMED IS:

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1. An apparatus for handling special windows in a display, comprising:
a window manager to embed special window information in a video
signal; and
5 a window decoder to extract said special window information from
said video signal and responsively generate a display control
signal.
2. The apparatus of claim 1, wherein said window manager is included in
an operating system to simplify application software development.
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3. The apparatus of claim 1, wherein said window decoder is implemented
as an application-specific integrated circuit.
4. The apparatus of claim 1, further comprising:
a target area in said special windows to be specially processed in
response to said display control signal; and
a video interface to transmit data including said special window
information to said display.

5. The apparatus of claim 4, further comprising:

pixels contained in said display;

a first color signal serving as a video clock signal for said special window information; .

5 a second color signal including said special window information;

and

91 a third color signal.

6. The apparatus of claim 5, further comprising:

10 key signals including a pattern of bits of said special window information to encode a target area position, and corresponding to a pattern of said pixels depicted in said display.

7. The apparatus of claim 5, further comprising:

15 pixel pairs in said display, each member pixel of said pixel pairs being proximately located, said pixel pairs being colored according to said first color signal, said second color signal, and said third color signal in an additively complementary manner to visually approximate a single pixel of a mixed color.

8. The apparatus of claim 6, wherein components of said key signals include:

a start sequence indicating a beginning of said key signals;
a code sequence distinguishing said key signals from said data;
5 a horizontal offset sequence indicating a boundary of said target area relative to a horizontal position of said key signals;
a vertical offset sequence indicating a second boundary of said target area relative to a vertical position of said key signals;
a CRC checksum verifying said horizontal offset sequence and said
10 vertical offset sequence; and
a stop sequence indicating an end of said key signals.

9. The apparatus of claim 8, further comprising:

nondifferential key signal data indicating said start sequence and
15 said stop sequence; and
differential key signal data indicating remaining components of said key signals.

10. The apparatus of claim 8, further comprising:

20 a number sequence indicating a number of special windows.

11. The apparatus of claim 8, further comprising:

a shape sequence indicating a shape of said target area when said target area is not rectangular.

12. The apparatus of claim 8, further comprising:

a selection sequence indicating a selection from among a plurality of available special processes.

13. The apparatus of claim 6, wherein scroll bars in said special windows function as controls for special processing.

14. The apparatus of claim 6, wherein said key signals include hidden watermarks.

15. The apparatus of claim 6, wherein said key signals include visibly apparent symbols.

16. The apparatus of claim 6, further comprising:

key signal verification circuits identifying said special windows and
responsively enabling an attribute;

a vertical counter monitoring a number of vertically scanned lines
of said pixels occurring after a vertical synchronization
signal;

a horizontal counter monitoring a number of horizontally scanned
pixels after a horizontal synchronization signal;

registers storing said target area position in terms of said vertically
scanned lines and said horizontally scanned pixels when
said attribute is enabled;

a comparator monitoring a position of said pixels in terms of said
vertically scanned lines and said horizontally scanned pixels,
comparing said position of said pixels to said target area
position, and responsively generating said display control
signal to enable special processing.

17. The apparatus of claim 16, further comprising:

an internal logic clock signal denoting an intended duration for
said special processing of said pixels in said target area; and
a frequency control unit synchronizing said internal logic clock
signal to said video clock signal to regulate a horizontal
width of said pixels in said target area with a duration of
said display control signal, thereby calibrating said special
processing with a scan of said display.

18. The apparatus of claim 17, wherein said key signal verification circuits
enable said attribute when a duration of said key signals in terms of
internal logic clock signal periods is consistent with a key signal format.

19. The apparatus of claim 16, wherein said attribute is disabled by an
absence of said key signals.

20. The apparatus of claim 16, wherein said key signal verification circuits
enable said attribute when said key signals exist during one scan of said
display and persist for a number of scans of said display.

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21. A method for handling special windows in a display, comprising the steps of:

embedding special window information in a video signal;

extracting said special window information from said video signal

5 using a window decoder; and

generating a display control signal in response to said window information to enable different processing of said special windows in said display.

10 22. The method of claim 21, wherein said step of embedding is performed by a window manager that is included in an operating system to simplify application software development.

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15 23. The method of claim 21, wherein said window decoder is implemented as an application-specific integrated circuit.

24. The method of claim 21, further comprising the steps of:

specially processing a target area in said special windows in

response to said display control signal; and

20 transmitting data including said special window information to said display using a video interface.

25. The method of claim 24, further comprising the steps of:

depicting pixels in said display;

transmitting a first color signal serving as a video clock signal for

said special window information;

5 transmitting a second color signal including said special window
information; and

9 transmitting a third color signal.

26. The method of claim 25, further comprising the step of:

10 transmitting key signals including a pattern of bits of said special
window information to encode a target area position, and
corresponding to a pattern of said pixels depicted in said display.

27. The method of claim 25, further comprising the step of:

15 depicting pixel pairs in said display, each member pixel of said
pixel pairs being proximately located, said pixel pairs being colored
according to said first color signal, said second color signal, and
said third color signal in an additively complementary manner to
visually approximate a single pixel of a mixed color.

28. The method of claim 26, wherein said step of transmitting said key signals further comprises the step of concurrently transmitting within said key signals:

a start sequence indicating a beginning of said key signals;

5 a code sequence distinguishing said key signals from said data;

a horizontal offset sequence indicating a boundary of said target

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area relative to a horizontal position of said key signals;

a vertical offset sequence indicating a second boundary of said

target area relative to a vertical position of said key signals;

10 a CRC checksum verifying said horizontal offset sequence and said

vertical offset sequence; and

a stop sequence indicating an end of said key signals.

29. The method of claim 28, further comprising the steps of:

15 transmitting nondifferential key signal data indicating said start

sequence and said stop sequence; and

transmitting differential key signal data indicating remaining

components of said key signals.

30. The method of claim 28, further comprising the step of:
transmitting a number sequence indicating a number of special
windows.

5 31. The method of claim 28, further comprising the step of:
transmitting a shape sequence indicating a shape of said target
area when said target area is not rectangular.

10 32. The method of claim 28, further comprising the step of:
transmitting a selection sequence indicating a selection from
among a plurality of available special processes.

15 33. The method of claim 26, wherein scroll bars in said special windows
function as controls for special processing.

34. The method of claim 26, wherein said key signals include hidden
watermarks.

20 35. The method of claim 26, wherein said key signals include visibly
apparent symbols.

36. The method of claim 26, further comprising the steps of:

identifying said special windows and responsively enabling an

attribute using key signal verification circuits;

monitoring a number of vertically scanned lines of said pixels

5 occurring after a vertical synchronization signal using a
vertical counter;

monitoring a number of horizontally scanned pixels after a

horizontal synchronization signal using a horizontal counter;

using registers to store said target area position in terms of said

10 vertically scanned lines and said horizontally scanned pixels
when said attribute is enabled;

using a comparator to monitor a position of said pixels in terms of

said vertically scanned lines and said horizontally scanned

pixels, to compare said position of said pixels to said target

15 area position, and to responsively generate said display

control signal to enable special processing.

37. The method of claim 26, further comprising the steps of:

denoting an intended duration for said special processing of said
pixels in said target area using an internal logic clock signal;
and

5 using a frequency control unit to synchronize said internal logic
clock signal to said video clock signal and regulate a
horizontal width of said pixels in said target area with a
duration of said display control signal, thereby calibrating
said special processing with a scan of said display.

10 38. The method of claim 36, wherein said key signal verification circuits
enable said attribute when a duration of said key signals in terms of
internal logic clock signal periods is consistent with a key signal format.

15 39. The method of claim 36, wherein said attribute is disabled by an absence
of said key signals.

20 40. The method of claim 36, wherein said key signal verification circuits
enable said attribute when said key signals exist during one scan of said
display and persist for a number of scans of said display.

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The method of claim 26, wherein said step of transmitting said key signals further comprises the steps of:

transmitting a start sequence indicating a beginning of said key signals;

5 transmitting a code sequence distinguishing said key signals from said data;

transmitting a horizontal offset sequence indicating a boundary of said target area relative to a horizontal position of said key signals;

10 transmitting a vertical offset sequence indicating a second boundary of said target area relative to a vertical position of said key signals;

transmitting a CRC checksum verifying said horizontal offset sequence and said vertical offset sequence; and

15 transmitting a stop sequence indicating an end of said key signals.

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42. A system for handling special windows in a display, comprising:
- means for embedding special window information in a video signal;
 - means for extracting said special window information from said video signal; and
 - means for responsively generating a display control signal.

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43. A computer-readable medium comprising program instructions for handling special windows in a display by performing the steps of:
- embedding special window information in a video signal using a window manager;
 - extracting said special window information from said video signal using a window decoder; and
 - responsively generating a display control signal.

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